Draft Individual Review Form

Proposal number: #2001-F211-1 **Short Proposal Title: Keswick Metal Sludges FS 1-2**

1a) Are the objectives and hypotheses clearly stated?
Objectives and hypotheses are clearly stated in proposal body (p. 4-5); hypotheses also are outlined in table 1 indicating general data requirements and approaches for hypothesis testing. The objectives are to evaluate alternatives for reducing potential for toxic releases of metal sludges from Keswick Reservoir and for reducing the need for metering of clean water from Shasta and Whiskeytown Reservoirs for dilution of transported metals. The hypotheses are that removal or isolation of the sludge will (1) reduce releases [concentrations] of metals to the Sacramento River, reducing toxicity; (2) reduce the need for metering of clean water for dilution, enabling other beneficial uses of this water; and (3) reduce loads of metals in the Sacramento River and Bay-Delta, reducing stressors to aquatic life.

1b1) Does the conceptual model clearly explain the underlying basis for the proposed work?
A conceptual model shown as figure 2 explains the source and transport pathways of the metals contamination. Furthermore, the problem statement clearly indicates that high concentrations of metals accumulated in, and transported from, the Keswick Reservoir can be toxic to aquatic organisms downstream in the Sacramento River and Bay-Delta providing the conceptual basis for the proposed feasibility study.

1b2) Is the approach well designed and appropriate for meeting the objectives of the project?
The approach for the feasibility study is explained clearly and is outlined for budget justification as tasks in a logical progression. As designed, the feasibility study and selection of remediation are described as phase 1 tasks. Design, pilot testing, field surveys, and final construction estimates are described as phase 2 tasks.

1c1) Has the applicant justified the selection of research, pilot or demonstration project, or a full-scale implementation project?
Pilot studies and analysis are proposed for evaluation as the feasibility study. Additionally, bathymetric surveys are proposed to quantify the volume of contaminated material. Progressive steps for design and review of chosen alternative for full-scale implementation are described which are reasonable.

1c2) Is the project likely to generate information that can be used to inform future decision making?
The information collected during the feasibility study will be used to decide appropriate method for preventing toxic releases from Keswick Reservoir.

2a) Are the monitoring and information assessment plans adequate to assess the outcome of the project?
Details of the monitoring program are sparse but the general approach as described in table 2 for hypothesis testing should be adequate to evaluate the outcome of the project considering pre- and post-project monitoring of sludge quantities and water quality. Additionally, proposed evaluation of fish migration and spawing success in the Sacramento River will assist in the evaluation of the effectiveness of implemented remediation.

2b) Are data collection, data management, data analysis, and reporting plans well-described, scientifically sound and adequate to meet the proposed objectives?
Data collection and management are described as routine procedures conducted in accordance with EPA standards, but details are sparse. The reviewer must assume that the water-quality monitoring will meet EPA quality criteria and that locations and times of monitoring are distributed to evaluate low-flow, high-flow, and migration period conditions. Although sludge dewatering tests are described, toxicity testing of the sludge is not described. As explained in the proposal, the sludge is destined to be landfilled.

3) Is the proposed work likely to be technically feasible?
The scope of work is reasonable and technically feasible.

4) Is the proposed project team qualified to efficiently and effectively implement the proposed project?
The project team is multidisciplinary and represented by senior level experts in their respective fields. The reviewer has personal knowledge of the expertise of two members who are internationally recognized experts on mine drainage and metals transport issues.

Miscellaneous comments
Minor typographical errors were a distraction but were not misleading. Presumably, on page 14, under Budget, 1st paragraph should state, "…If the "No Action" alternative is selected, Phase **2** costs will not be required."

Overall Evaluation Summary Rating	**Provide a brief explanation of your summary rating**
☐ Excellent ■ Very Good ☐ Good ☐ Fair ☐ Poor	The problem is clearly identified and proposed work is feasible with high potential for success.